Botanical Gazette.

Vol. VII. APRIL, 1882. No. 4.

Editorial.—Mr. E. L. Greene describes six new species of Compositæ in the *Torrey Bulletin* for February. Half of them belong to the genus *Hemizonia*.

New stations are being found for *Asplenium ebenoides*, but not much definite information is gained with reference to the origin of this suspicious species. Whether it is a hybrid between *Camptosorus* and *A. ebeneum* or not still remains to be decided, though the burden of testimony all seems to be in favor of that idea.

Mr. John H. Redfield calls attention to the fact that Dr. Gray, in his Synoptical Flora of N. Am., says that *Plantago elongata*, Pursh, of "Bradbury's collection on the Missouri, is unknown, probably a glabrate form of *P. Patagonica*." Pursh's specimen ticketed (probably from Lambert) *P. elongata*, and noted as from Bradbury, has recently been found in the herbarium of the Philadelphia Academy and proves to be unmistakably *P. pusilla*, Nutt.

Our plant collectors have been unusually active during the past season, and the result is appearing in the unusual number of desirable plants for sale. Handsome catalogues have been received from the Parish Bros., San Bernardino, Calif., Wm. C. Cusick, Union, Oregon, and Prof. Marcus E. Jones, of Salt Lake City. Add to these Mr. Geo. R. Vasey, Mr. C. G. Pringle, Mr. J. G. Lemmon, Mr. W. N. Suksdorf, and Mr. H. H. Rusby, and it looks as though a botanist can obtain almost any western plants he desires.

Prof. J. C. Arthur has issued a fourth "Contribution to the Flora of Iowa." The Flora of this state bids fair to be thoroughly known, for it contains as fine a corps of active collectors as any state can boast. In the present paper the plants to be credited to the state, and not found in Gray's Manual, are *Artemisia serrata*, Nutt., *Senecio lugens*, var. *Hookeri*, Eaton, *Plantago Rugelii*, Decaisne, *Gerardia tenuifolia*, var. *macrophylla*, Benth., *Cuscuta Gronovii*, var. *latiflora*, Engelm., *Polygonum Muhlenbergii*, Watson, *Aristida purpurea*, Nutt.

Thomas P. James.—It is with great regret that the Gazette is called upon to record the death of this eminent botanist. He died in Cambridge, Mass., February 22, in his 79th year. Most of his

life was spent in Philadelphia in mercantile pursuits. From his youth he devoted his leisure to the study of *Cryptogamia* and at the time of his death was recognized by the best authorities as one of the two leaders in the scientific world in the knowledge of mosses and lichens. Retiring from business in 1869 and desiring to devote himself to scientific pursuits, he removed to Cambridge. In Philadelphia he was an officer of the Pennsylvania Horticultural Society. He had been treasurer of the American Pomological Society since its origin until a year since, when he resigned that position. He was for a considerable time the chairman of the committee of publication of the American Philosophical Society, and was connected with other important societies. At the time of his death he was engaged in the preparation of a Manual of North American Mosses, in connection with Mr. Leo Lesquereux, to which he was bringing the experience of forty years' study. Quoting the words from the private letter of a friend; "The study of plants, I believe, is conducive to longevity, but cannot confer immortality. We can only gather whilst the summer lasts and winter must come at last 'to shake all our buds from blowing.' "

The White Pine.—Mr. W. H. Ballou, of Evanston, read a paper before the American Association for the Advancement of Science, at Cincinnati, in which occurs the following passage with reference to the origin of the White Pine in Michigan:

The first thought suggested is relative to the origin of the white pine forests. From whence came the species which so strictly confines itself to its own peculiar territory? The oak and most other trees are naturally reproductive, and young trees are equally prolific in their growth on the same soil where the first forest was leveled to the ground. They may be transplanted on almost any territory, and without any special care, speedily growing up to a state of usefulness to man. Not so with the white pine. It is now an almost undisputed fact that it will not reproduce on the parent soil, and that when transplanted elsewhere, its development is marked with early decay in so many instances as to disparage the work. Furthermore, it is beset at once with the same host of natural enemies common to it on indigenous ground.

For some years past my attention has been directed to some facts which may have bearing on the question under consideration. The pine of the level country east of the Rocky Mountains seems to have its best growth in proximity to the lake region. I have noticed that frequently, where a lake recedes, leaving a sandy beach, evergreens, the juniper, pines, etc., are very apt to spring up. Within the memory of man, a wide sand beach near Waukegan has been made, and on this area a miniature white pine forest has appeared, and thrives. On some lone islands in Lake Erie, of evident recent formation, called the East Sister, the Old Hen, etc., I observed several years since that a similar phenomenon had occurred. These

and other facts point to a recent origin of the pine forests under consideration, which might not have been in existence at the time of the landing of Columbus. This fact is more apparent when it is stated in this connection that the average age of the pine is less than three hundred years in this country; and the other fact is reiterated that it does not reproduce on the same soil. The present pine forests, then, doubtless took the place of some other species, which had exhausted the soil necessary to their existence, a phenomenon well known to naturalists. It matters not whether the seeds were blown there by the winds, or lay dormant in the soil until their turn, or, indeed, what the speculation concerning them is, so long as the facts are inaccessible; certain it is the origin of the pine forests in Michigan is a matter of several centuries ago.

Ueber die weiblichen Bluethen der Coniferen, von A. W. Eichler, Berlin, 1881 (a pamphlet of 32 octavo pages, and a double plate).—In this interesting paper Professor Eichler frankly avows that his views respecting the female flowers of Coniferæ have undergone some important changes since the publication of his Bluethendiagramme. The views now held are, as he states, essentially those found in Sachs' Lehrbuch, but he adduces copious illustrations in support of them, and adds a succinct history of the controversy regarding gymnospermy. Since the time of Robert Brown most botanists have held that the ovules of Coniferæ are naked, while a few have considered them as ovaries with single ovules. The main point, however, in the late discussions has been with respect to the nature of the bodies, often scale-like, from which in most cases the ovular structures arise. Notwithstanding their flatness, the scales have been looked upon by some as axial in their character; by others as leaves and hence carpellary. From the short extract which is translated below it will be seen that the author does not regard it as impossible to harmonize the conflicting views, at least in part. "In all Coniferæ, the scales of the so-called female ament represent nothing but simple leaves; the inner scales, where they are met with, being ventral outgrowths therefrom. The ovules take their origin either on the inner surface of these leaves or in their axils (in *Taxus* and *Torreya* only, they appear at the apex of a special bracted axis. In these two genera the ovules are to be regarded as female flowers; in all the other genera the ament represents collectively the individual female flowers, the leaves being open carpels.). At first sight there appear to be important morphological differences which, in a family so conspicuously natural as Coniferæ, we should not expect to find. Thus in one case the ovule seems to be an appendage of the leaf, in another, axillary and therefore seemingly an axillary shoot, and, thirdly, a body at the end of a leafy axis. But these differences are not so great as they appear. The ovule has the character of a macrosporangium, and may perhaps rightly bear this name, as many have proposed. Therefore, what we see realized in a macro-

sporangium (or in a sporangium in general) ought not to surprise us in the case of an ovule. Now it is certain that in *Isoetes,* the sporangia stand on leaves, in *Selaginella* and *Lycopodium* in the axil of the leaf, in *Psilotum* and *Tmesipteris* (as Göbel has lately pointed out) at the apex of a leafy axis. All these genera belong to the same circle of relationship, and also to the very one from which the Coniferæ have descended. The variations therefore serve to strengthen rather than to weaken our position. To be sure, we must give up the notion that the ovule represents either a leaf-segment or a bud, or has been derived from a metamorphosis of one of these two structures; it is the macrosporangium inherited by the phanerogams from the higher cryptogams, but more or less transformed and taking on, like that, a structure *sui generis.* It can be compared to an outgrowth ("emersion"),but it must not be regarded as the exclusive privilege of leaves, or as exclusively axial. The ovule may take its origin like other outgrowths from one organ, or another, or at the limits of the two (that is, in the axil of a leaf). This is plainly so in Coniferæ, as we have seen, and is the case in Angiosperms beyond a doubt." A minor question is incidentally discussed in the paper and again treated of in a subsequent pamphlet by the same author (Ueber Bildungsabweichungen bei Fichtenzapfen, Berlin, 1882). Monstrosities in the scales of fir cones had been adduced by some writers as evidence that the seed-scales are not simple but compound structures. A re-examination of the specimen used in support of this theory, and a study of other new examples have served to convince Professor Eichler that the carpillary "scale is a simple organ, but that by the appearance of a bud on the posterior aspect, it may undergo all kinds of deviations, and even split into two or more often three leaf-like lobes."—G. L. GOODALE.

Githopsis.—Baillon in Bull. Soc. Linn., Paris, no. 38, p. 304, states that besides wild specimens of *G. specularioides,* the herbarium of the Museum at Paris has specimens raised from Texan seeds in the Botanic Garden at Cambridge, which show that the capsule dehisces by triangular "*panneaux*" below the calyx; wherefore the genus subsides into *Specularia.* Now *Githopsis* is unknown in or near Texas, and has never been raised in the Cambridge Garden. *Specularia Lindheimeri* is Texan and has been cultivated here. It appears that Baillon has taken this for *Githopsis.*—A. GRAY.

Notes on Ambrosia trifida.—Last year I made quite extensive researches as to the facilities presented by weeds for the dissemination of seeds, hoping thereby to gain a true insight into their nature. The results show that an explanation is not to be sought here, but in their tenacity of life when injured, their power of de-

veloping branches in the lower axils of leaves, from roots, &c. Indeed, many weeds are almost destitute of arrangements for the distribution of seeds. One of these is the common ragweed, *Ambrosia trifida*. In this I noted an occurrence, properly belonging to the study of Natural Philosophy, but which may interest even the botanist. The akenes of this plant have a stout central process, $\frac{1}{3}$ the length of the seed, surrounded at the base by five slight protuberances. On a clear morning, when the fields are covered with hoar-frost, go out into the fields in which this plant grew last summer. Wherever there is a seed exposed you find 5 or 6 strands of ice attached to these processes, sometimes separate but oftener in contact with one another, resembling asbestos in the arrangement of the "fibers" of ice. These, after making various contortions, resembling locks of hair, reach a length of $1\frac{1}{2}$ to 3 inches. During winter season the akenes are mostly half-buried by the earthy matter around them, but in the fall they lie loose on the ground. Now for our application to botany. The seeds being quite heavy generally are carried but a short distance from the stem; but when attached to these strands of ice, they are carried away by the winds, rolling over the ground; or the feet of animals in striking the ice —which always rises above the ground, often nearly perpendicular —propel the seed with the ice; and most frequently of all, becoming by this means attached to leaves, light twigs, &c., they are carried by these for short distances, which during the entire winter season, may amount to a considerable distance, for a plant presenting no other facilities.

Why do not other seeds, as well as our common ragweed, have these curls of ice? Or have they been noticed elsewhere? No doubt this plant offers peculiar facilities in this direction. The seeds present an extraordinary amount of surface by means of these processes, radiation of heat being more advanced here, they offer the first attachment for the dew, which precipitated on the seeds, forms the curls of ice, while at the same time the processes give direction to the strands thus formed, and instead of an irregular mass of ice we have "ice-curls."—AUG. F. FOERSTE, *Dayton, Ohio.*

Depauperate Rudbeckia.—An interesting instance of the change which may be effected in the habit and growth of a plant, came to my notice last fall. One day while out walking, I came across a specimen of *Rudbeckia hirta*, L., which was to me a curiosity. The leaves were all radical, and the solitary flower was on a veritable scape, leafless and bractless. The leaves and flower were of the typical *R. hirta*, but instead of the plant being tall and branched as it is usually, it was only two inches high. The next week my brother found another specimen of the same description. This latter was a little taller, being about six inches high to the top of the scape, but all the leaves were radical and the scape was leafless. This is an interesting instance of the way in which a

long period of hot and dry weather can reduce a tall branching plant, to a low branchless one, and may show under what influences plants may acquire the leafless scapes and radical leaves which are characteristic of so many species.—Jos. F. JAMES, *Cincinnati, Ohio.*

Proterandry in Amaryllis reginæ.—The species here named is now occasionally cultivated from South America as a house plant, for which purpose it possesses many desirable characteristics. The large crimson-red, nodding flowers exhibit proterandry in a manner easily observed. The stamens are in two sets of three each, the outer being somewhat shorter than the inner. They are all nearly straight at first but soon begin to curve upward.

The anthers are versatile, and when first appearing are ¾ of an inch in length. From six to ten hours after the flower opens the dehiscence of the anthers takes place by a gradual splitting open on each side, the valves rolling up so as to hide their external surface completely from view; or in other words the anther is turned inside out. At the same time the valves become fluted like a ruffle thereby shortening the anther so that when the dehiscence is complete the anther is only about 3-16 of an inch long. The dehiscence takes place in the short stamens about four or five hours before it does in the long ones. The pollen is very abundant, forming nearly one-half the bulk of the anther. The styles of the three-celled ovary are united into one, with a three-lobed stigma. During the dehiscence of the anthers the stigma remains closed, and is turned downward away from the anthers, thus preventing any pollen from coming in contact with it. After about twenty-four hours the style curves upwards, and the lobes of the stigma turn back, or open, and are ready to receive the pollen. This, however, must now come from a fresh anther of another flower. From the structure of the flower, and the character of the pollen it is well nigh impossible that the latter could be brought to the stigma by the wind. No doubt, therefore, this Amaryllis in its native region is wholly dependent for its fertilization upon some insect, probably some moth with a long proboscis. To this end a liberal supply of nectar is secreted at the bottom of the perianth.—J. TROOP, *Botanical Laboratory, Ithaca, N. Y.*

Grape Mildew.—In the GAZETTE for March I stated that the conidia of *Peronospora viticola* were not known to occur on the flowers and young berries of the grape in this country. The remark is untrue as far as the Western States is concerned, for in the Transactions of the St. Louis Academy of Science of Sept. 16, 1861, Dr. Engelmann mentions that in Missouri the fungus appears in June, and on the pedicels and young berries when they are of the size of small peas or smaller, although he had never seen it on full grown berries. The early occurrence of the fungus in Missouri

would accordingly account for the fact that the vines suffer more from the fungus in the Western than in the Eastern States.—W. G. FARLOW.

Notes from the Mississippi Pine Barrens.—The winter has brought little cessation in vegetable activity. With the late blooming fall flowers, Asters, (especially *A. squarrosus* and *A. adnatus*), *Ascyrums* and *Lobelia glandulosa*, would open now and then, a belated Cape Jasmine, and a second bloom of several spring flowering plants. Pear trees and apricots bloomed throughout November; *Gelsemium sempervirens* on Nov. 22nd, and *Crataegus Pyracantha* during the first week of December. *Stellaria media* has been in continuous bloom. The thirty rainy days in the month of January gave no opportunity for rambles in the Pine Woods, but *Arabis Ludoviciana* appeared January 7th, and *Houstonia minima* on the 10th. The gardens were fragrant with English violets, Hyacinths and Narcissi, *N. Polyanthus* opening first on Christmas day. In *N. Tazetta*, the polymorphism of the perianth is very frequent, occurring with but three, or sometimes four divisions in the same umbel with the normal flowers. The number of stamens is also reduced to correspond with the perianth. From day to day an adventurous rose would open. The dainty *Rosa Banksiae* first appeared, January 19th. *Magnolia purpurea* and *Pyrus Japonica* were in bloom February 2nd, when the Yellow Jessamine was again opening in sheltered spots. On February 4th the ground, in moist places, was starred with *Ranunculus fascicularis;* the dark-eyed, purple *Houstonia* was everywhere abundant; *Viola primulaefolia*, *Prunus Caroliniana*, *Vaccinium tenellum* and *Allium striatum*, were blooming, and over the Barrens many mosses were beautifully in fruit.—MARTHA B. FLINT, *Brookhaven, Miss.*

New Species of Fungi; by Chas. H. Peck.—CANTHARELLUS MORGANI.—Pileus thin, plane or centrally depressed and subinfundibuliform, glabrous, red, the margin involute; lamellæ narrow, decurrent, dichotomously branched, whitish; stem equal or slightly enlarged above, solid, paler than the pileus; spores minute, subelliptical, .00016—.0002 of an inch long.

Plant 8–12 lines high, pileus 6–10 lines broad, stems 1–2 lines thick.

Under coniferous trees. Vermont. *A. P. Morgan.*

This is a small species resembling *C. Guyanensis* Mont., which, according to the description, differs in its thick coriaceous reddish-orange pileus, yellow hymenium and thick corneous fistulose stem. The pileus in our plant has a light-red or pinkish-red color, and I do not detect any peppery taste to the flesh.

POLYPORUS FRAXINOPHILUS.—Pileus sessile, thick, corky, more or less ungulate, somewhat decurrent, concentrically sulcate, rimose

when old, the first year whitish, then gray or cinereous, finally black, the margin obtuse, the substance obscurely zoned within, at first whitish, then isabelline; pores medium size, stratose, nearly plane, subrotund, the dissepiments obtuse, entire, whitish; spores white, broadly elliptical, .0003–.00035 of an inch long, .00025–.0003 broad.

Pileus 2–4 inches long, 1–2 inches broad.

Dead or languishing trunks of ash trees. Dakota. *C. W. Irish.* Arizona. *C. G. Pringle.*

This Polyporus belongs to the FOMENTARII. It varies considerably in shape, some specimens being almost as much flattened as the thicker forms of *P. applanatus*, others being as thick as the ordinary forms of *P. fomentarius*. Specimens three or more years old are somewhat tri-colored, the oldest part being black and full of chinks or cracks, the margin whitish and the intermediate part gray or cinereous. The annual additions are separated by concentric grooves. In the Dakota specimen the annual additions are much broader than in the Arizona specimens, and the pileus is more flattened and thinner. The interior substance is at first whitish but it changes with age to a brownish-yellow or isabelline hue, thus forming a connecting link between the second and third sections of this tribe as given in the Epicrisis of Fries.

MERULIUS RUBELLUS.—Pilei mostly cæspitose, imbricated, sessile, dimidiate, soft, somewhat tenacious, tomentose, deep-red when fresh, paler when dry, the margin usually undulate, inflexed; hymenium whitish or cream-colored, the folds much branched, porous-anastomosing; spores minute, elliptical, colorless, .00016–.0002 of an inch long, .0001–.00012 broad.

Pileus 2–3 inches long, 1–2 inches broad; tufts sometimes six inches long.

Decaying trunks of beech trees, *Fagus ferruginea*, in dense woods. Near Cincinnati, Ohio. December. *A. P. Morgan.*

This is a beautiful species, similar to *M. tremellosus* in the size and thickness of the pileus, but very different in color. The fresh moist pileus is a deep red (Indian red) but in drying it fades to a pinkish-gray or to a grayish hue with a red margin. The texture is almost floccose-tomentose, with the upper part red, the lower white. According to the notes sent me by Prof. Morgan, it differs from the description of *M. incarnatus* in the pileus not being "coriaceo," the folds neither "subtremellosis" nor "luteis roseisve," the mode of growth not "steliatim provenit" and the habit not being "ad cortices dejectos *Quercus albæ, falcatæ*," although fallen trunks of *Quercus alba* were more abundant in the locality where it was collected than were those of the beech.

PUCCINIA BRANDEGEI.—Spots none, sori amphigenous or caulincolous, often confluent, reddish-brown, distorting the stems and petioles; spores subelliptical, smooth, .0011–.0014 of an inch long, .0008–.001 broad; pedicels short.

Living leaves and stems of *Corydalis Brandegei*. Colorado. *T. S. Brandegee.*

PUCCINIA BOISDUVALIÆ.—Spots indefinite, yellowish, often tinged with red or brown; sori few, scattered, amphigenous, brown; spores obovate or oblong-elliptical, obtuse, slightly constricted at at the septum, smooth, .0014–.0016 of an inch long, .0008–.00095 broad; pedicels short, colorless.

Living leaves of *Boisduvalia Torreyi*. Santa Cruz, California. *M. E. Jones.*

UROMYCES JONESII.—Spots none; sori amphigenous, small, scattered, reddish-brown; spores subglobose to elliptical, verruculose, .0011–.0014 of an inch long, .0009–.0011 broad; pedicel short, colorless.

Living leaves of Ranunculus. Soda Springs, California. *M. E. Jones.*

The roughly warted spores and scattered amphigenous sori are notable features in this species.

TRICHOBASIS WYETHIÆ—Spots none; sori dot-like, abundant, often occupying the whole lower surface of the leaf, reddish-brown; spores subglobose or broadly elliptical, .0012–.0016 of an inch long, .0008–.0012 broad.

Living leaves of *Wyethia angustifolia*. Colorado. *T. S. Brandegee.*

TRICHOBASIS HELIANTHELLÆ.—Spots pale greenish; sori hypophyllous, numerous, generally most abundant along the midrib, reddish-brown; spores globose or subglobose, uninucleate, .0012–.0014 of an inch in diameter.

Living leaves of *Helianthella Californica*. Soda Springs, California. *M. E. Jones.*

Plucheas.—*Pluchea camphorata*, *P. fœtida*, and even *P. purpurascens*, DC., appear to be forms of one variable and widely diffused species. Is the plant of the Mississippi valley found growing anywhere far from subsaline soil, and is the root perennial? Is the root of *P. camphorata* ever perennial?—A. GRAY.

On the Power possessed by Leaves of placing themselves at Right-Angles to the direction of Incident Light: by Francis Darwin. Journal of the Linn. Soc., no. 112 (vol. xviii, pp. 420–455), published June, 1881, read Dec. 16, 1880.—Taking up this subject where it was left by his father and himself in the work on "The Power of Movement in Plants," Mr. Francis Darwin, in this paper, records his investigations and experiments made with a well-devised modification of Sachs' Klinostat, with the view of determining whether Frank's or DeVries's explanation of the position which leaves normally assume with respect to the light is the more

tenable. While the vertical position assumed by the growing plant's axis is attributed to geotropism and heliotropism, Frank attributes the position taken by leaves (with one face to the sky and the other to the ground) to transverse geotropism and transverse heliotropism. "An organ which grows transverse-geotropically, places itself horizontally. .... In the same way a transversly heliotropic organ has an inherent tendency to place itself at right-angles to, instead of parallel [as does the stem] to the direction of incident light. It may be said that this is no explanation at all; and this is true in a certain sense. But there is no reason why it should be more unsatisfactory than the accepted explanation of the vertical growth of stems and roots, namely, that they have an inherent power of growing in these directions." Indeed the one is just as satisfactory or unsatisfactory as the other. The terms "geotropism," "heliotropism," "apheliotropism" and the like, transverse or otherwise,—now a numerous brood,—are useful and not misleading, when held to mean only that, in fact, a leaf "has an inherent tendency to be horizontal," or "to place itself at right-angles to the direction of incident light" and "the hypocotyl of a seedling has an inherent tendency to grow vertically upwards. "The technical terms are unsatisfactory only when they are supposed to carry more explanation than the simple and untechnical statement does. But do leaves take their position in virtue of an inherent tendency? This is substantially denied by DeVries,or at least he maintains that the assumption is needless, for that it may be the result of an antagonism between positive and negative heliotropic and geotropic forces, or between these and what he calls *epinasty* and *hyponasty*. These new technical terms are simple in meaning. An organ, such as a leaf, is epinastic when the upper half grows in length more than the lower, and the effect is convexity above and concavity below, or downward curvature: it is hyponastic when the reverse takes place. And the suggestion is, that the horizontal position of a leaf under zenith illumination may be due simply to an equilibrium between two or more of these opposing forces. It is unnecessary to enter into particulars of how this obviously might produce the effect: for the result of Mr. Francis Darwin's experiments is a clear disproof of DeVries' suggestion. In the "fundamental experiment:..if a plant whose leaves have the power of placing themselves at right-angles to incident light is growing normally in the open air and lighted from above, its leaves will be horizontal. Let the plant be now made to rotate on a klinostat [so slowly that no centrifugal effect will be produced, but rapidly enough to destroy all geotropic action] so that the axis of rotation coincides with the axis of the plant. And let the direction of the incident rays of light be parallel to the axis of rotation, so that the morphologically upper side of the leaves is illuminated by rays striking them at right-angles, just as they were when the plant grew on the ground. Then, if the normal horizontal position is the result of a balance between geotropism

(positive or negative) and any other force—epinasty, hyponasty, positive or negative heliotropism,—it is clear that, geotropism being destroyed by the rotation, the balance cannot be maintained." The experiments, varied in many ways, and with arrangements to eliminate epinastic and hyponastic tendencies, plainly bring out the conclusion "that the power which leaves have of placing themselves at right-angles to the incident light is due to a specialized sensitiveness to light, which is able to regulate or govern the action of other external forces, such as gravitation, or of internal forces, such as epinasty."—A. G. *in Am. Jour. Sci.*

Ranunculus.—I invite attention, this season, to the various forms which in this country pass under the name of *Ranunculus repens*, L. I suspect that the European species, one which merits the specific name, is not indigenous to the United States, but is occasionally met with as a naturalized plant. The "third form" with "spotted leaves," mentioned in Mr. Ward's new Flora of Washington, would seem to be of this species. Does the low and early-flowering form of our common species make runners later in the season? And do the larger forms of low ground freely produce prostrate shoots and do these take roots?"—A. GRAY.

Botanizing on Comanche's Peak, Texas.—This high bluff is one of the most remarkable features of Central Texas. Situated six miles south of Granbury, it towers above the beautiful valley of the Brazos like an immense citadel, its height above the valley being estimated at six hundred feet. It is seen from long distances in every direction and from its top a most extensive view is obtained. Like an isolated sentinel, it seems to be the only remnant of a vast plateau that has been washed away. Belonging to the Cretaceous Period, its rocks full of interesting marine fossils have characterized one group of that period, bearing the name of *Comanche's Peak Group.*

In September, 1881, my wife and I visited the peak on a botanizing expedition, but the season was not favorable except for a few grasses which I will mention below. The *Euphorbia Fendleri* and *Paronychia Jamesii* were the only interesting plants in bloom. On the rocks which had fallen from the top of the peak we noticed some *Solidago nemoralis* in bud, but most of the species were detected by means of leaves, or dried stems bearing seeds; such as *Arenaria Michauxii*, *Erythræa Texensis*, *E. Beyrichii*, and *Sabbatia campestris.* We looked eagerly for ferns, but only two were obtained, *Pellæa atropurpurea* and *Notholæna dealbata*, of the latter only a small specimen. The pretty *Cereus pectinatus* is also growing there, being, I think, one of its more northeastern stations.

The grasses were; 1, a *Bouteloua* much resembling *oligostachya* but with culms 2 or 3 feet high and that in poor rocky soil; 2, *Leptostachya dubia*; 3, *Tricuspis* (probably *mutica* of Torrey); 4,

Aristida, probably a new species. The last three species were growing on rocks on the very top of the peak. The first is abundant in rocky prairies near the base of the mountains. I have sent these grasses to Dr. Vasey of the Department of Agriculture, and he has not yet reported definitely about them.

The sides and part of the top of this great bluff are covered with a thick growth of mountain cedar (*Juniperus occidentalis*, var. *conjungens*), red oak (*Quercus rubra*), live oak (*Q. virens*), and shin oak (*Q. sinuata*, var.?). Among these we noticed the following shrubs; *Celtis reticulata*, *Ptelea trifoliata*, var. *mollis*, *Morus parvifolia*, *Rhus trilobata*,and the curious evergreen *Berberis trifoliata*.

I have no doubt that the locality is very rich in plants, and the botanist who will visit it in a good season will be well repaid for his trouble, besides the pleasure of viewing beautiful landscapes.

The settlers about the peak have assured us that they are generally favored with more or less rain while the country 8 or 10 miles distant is suffering from drouth. Some of our own observations seem to corroborate this statement.

In crossing the Brazos 6 miles from the peak we found on the sandy banks of that river fine blooming specimens of the following species: *Heliotropium convolvulaceum*, *Euphorbia hexagona*, *Dalea lanata*,*Aster spinosus*,*Cycloloma platyphylla*, and *Enslenia albida*.— J. REVERCHON, *Dallas, Texas.*

North American Grasses.—In the April *Naturalist* Dr Vasey gives some notes on N. Am. Grasses,based on Mr. Bentham's recent paper on *Gramineæ*. As all botanists are interested in the proposed changes we will note a few of those that most concern us. *Polypogon* is placed under the *Panicaceæ*. *Thurbera* is a new genus made to include two species of hitherto doubtful relations, and most happily named. *Sorghum nutans* is not *Sorghum* at all, but *Chrysopogon*. *Sorghum* includes only the cultivated *S. vulgare* and *S. Halapense*. *Muhlenbergia* is made to include *Vaseya*. *Sporobolus* includes *Vilfa*. In *Deyeuxia* are included all our species of *Calamagrostis* except two or three which go into *Ammophila*. All our native species of *Aira* are referred to *Deschampsia*. *Lepturus paniculatus*, Nutt., is referred to *Schedonnardus*. *Eleusine* includes *Dactyloctenium*. *Leptochloa fascicularis* again appears as *Diplachen fascicularis*. *Triodia* includes *Tricuspis* and *Uralepis*. *Triplalis* appears with two N. Am. species. Our *Brizopyrum* is *Distlichiss*, Raf. *Briza* includes *Calotheca*. *Atropis* is referred to *Glyceria*. *Bromus* includes *Ceratochloa*. Our native *Triticums* are referred to *Agropyrum*. *Gymnostichum* is referred to *Asprella*.